FluWatch

Public Health Agency of Canada | Agence de la santé publique du Canada

December 14 to December 20, 2014 (week 51)

Overall Summary

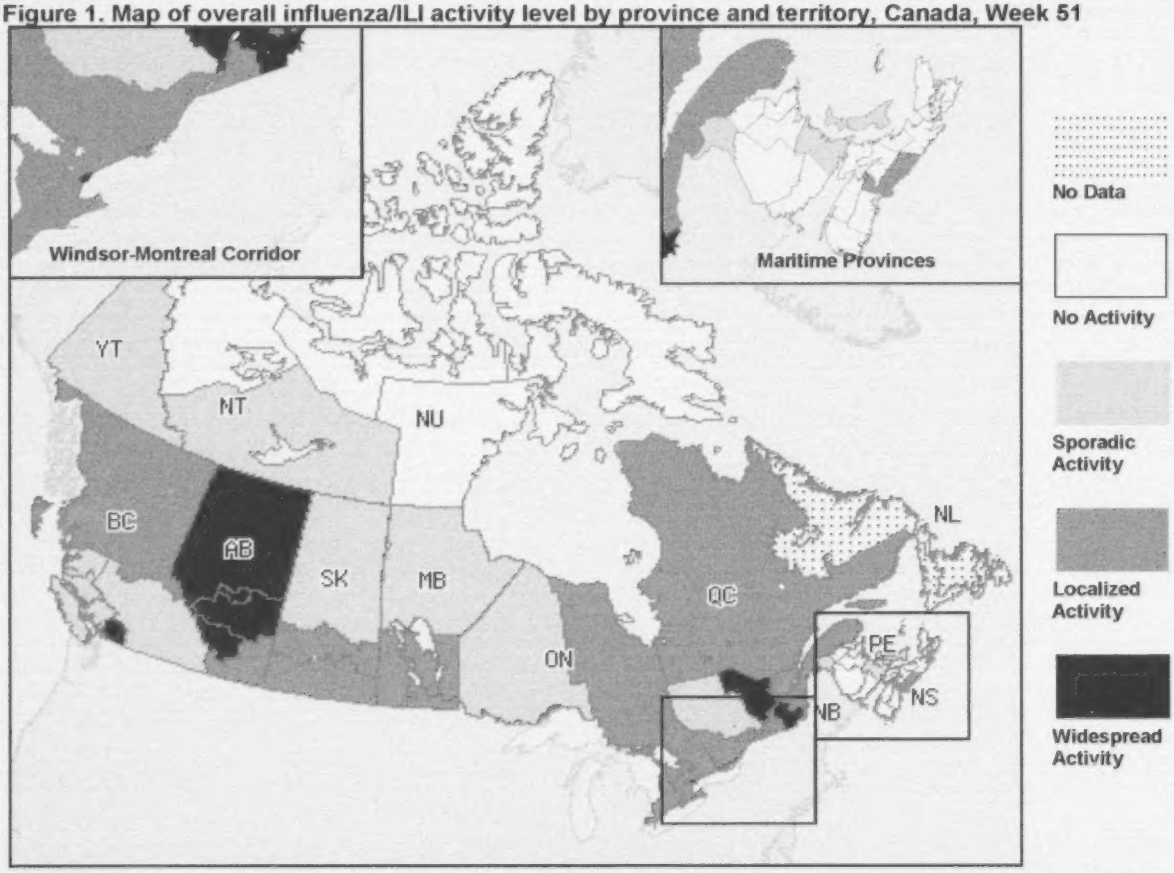
- In week 51, laboratory detections of influenza increased sharply for the fifth consecutive week. The majority of laboratory detections continued to be reported in AB, ON and QC; but with increasing activity in SK and NL.
- A(H3N2) continues to be the most common type of influenza affecting Canadians. In both laboratory detections and hospitalizations, the majority of cases have been among seniors ≥65 years of age.
- Similar to the previous week, there were a large number of newly-reported laboratory-confirmed outbreaks of influenza: 125 influenza outbreaks in 7 provinces, of which 94 were in long-term care facilities (LTCF).
- The rate of antiviral prescriptions more than doubled from the previous week, increasing especially among seniors.

Are you a primary health care practitioner (General Practitioner, Nurse Practitioner or Registered Nurse) interested in becoming a FluWatch sentinel for the 2014-15 influenza season?
Contact us at FluWatch@phac-aspc.gc.ca

Influenza/ILI Activity (geographic spread)

In week 51, eight regions reported widespread activity [in BC, AB(4), ON, QC(2)], 17 regions reported localized activity [in BC, AB, SK(2), MB(4) ON(5), QC(3), NS], and 12 regions [in NT, YK, BC(3), SK, MB, ON, QC, NB(2), PE] reported sporadic activity.

Figure 1. Map of overall influenza/ILI activity level by province and territory, Canada, Week 51

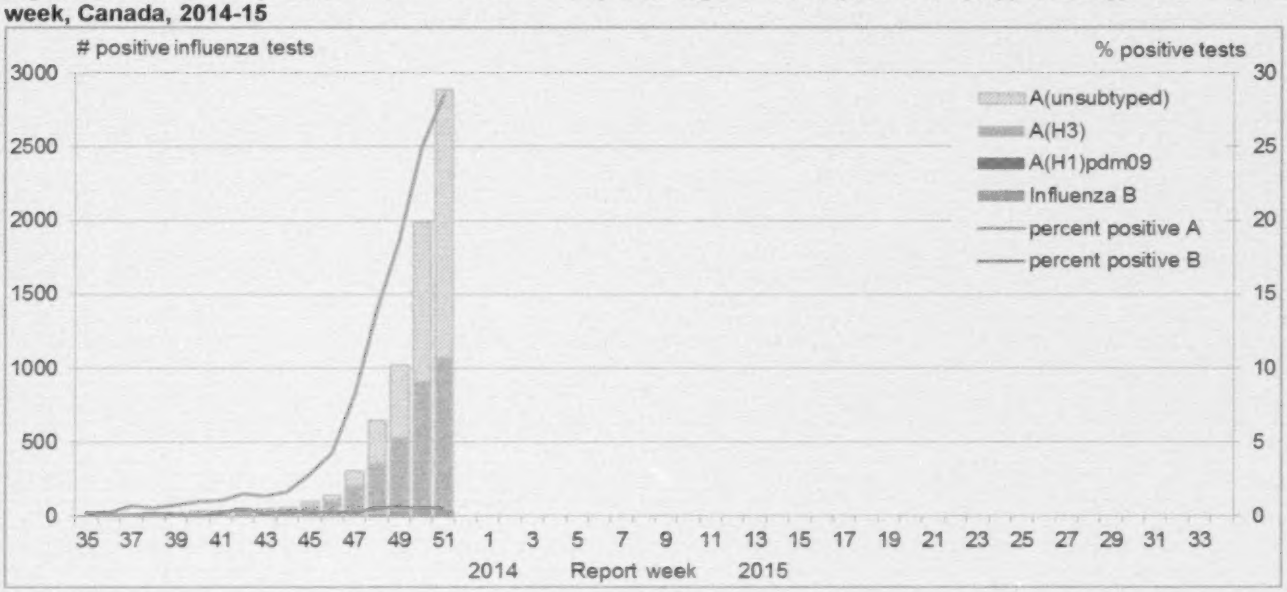


Note: Influenza/ILI activity levels, as represented on this map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, sentinel ILI rates and reported outbreaks. Please refer to detailed definitions at the end of the report. Maps from previous weeks, including any retrospective updates, are available on the FluWatch website.

Influenza and Other Respiratory Virus Detections

In week 51, the number of positive influenza tests increased sharply to 2,833 influenza detections (29.1% of tests), predominantly due to influenza A (Figure 2). To date, 97% of influenza detections have been influenza A, and 99.8% of those subtyped have been A(H3) (Table 1). The timing of the season and predominant A(H3N2) subtype is similar to the pattern observed during the 2012-13 influenza season when percent positive for influenza peaked in week 52 (35%). To date, among the cases of influenza with reported age, the largest proportion was in adults ≥65 years of age (56%) (Table 2).

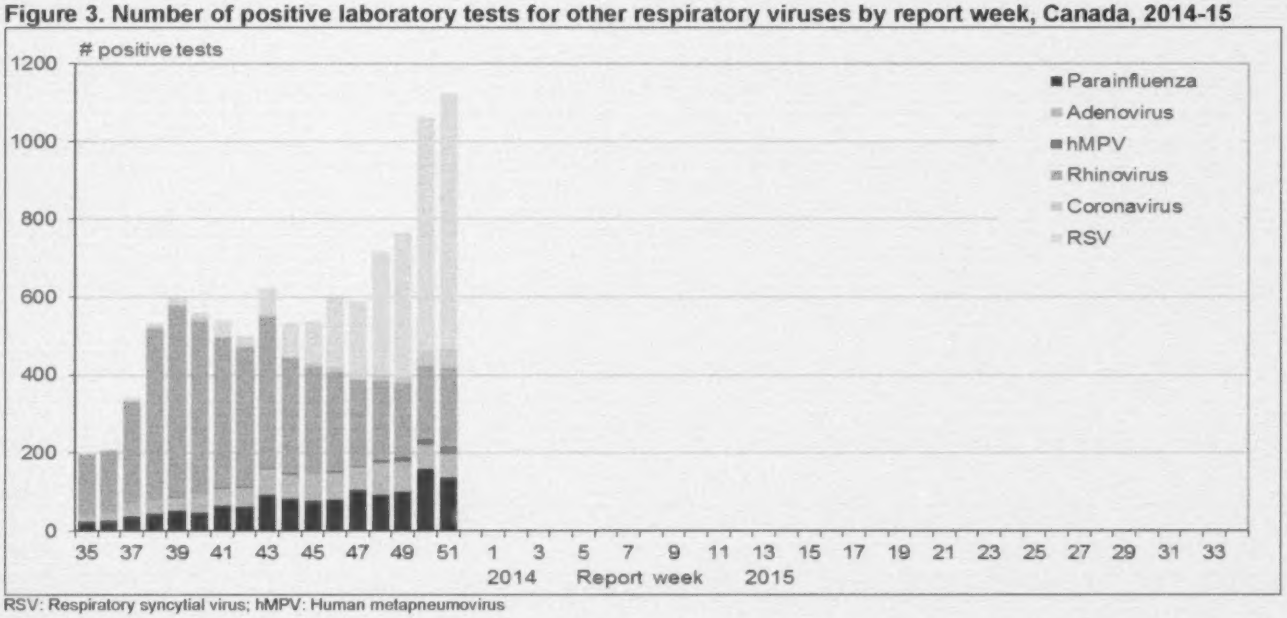
Figure 2. Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, 2014-15



In week 51, the number of positive RSV tests increased to 655 RSV detections and was the second most frequently detected virus, after influenza. Detections of parainfluenza and adenovirus also continue to follow their seasonal patterns of broad winter circulation (Figure 3).

For more details, see the weekly Respiratory Virus Detections in Canada Report.

Figure 3. Number of positive laboratory tests for other respiratory viruses by report week, Canada, 2014-15



RSV: Respiratory syncytial virus; hMPV: Human metapneumovirus

Table 1. Weekly and cumulative numbers of positive influenza specimens by type, subtype and province, Canada, 2014-15

Reporting provinces[1]	Weekly (December 14 to December 20, 2014)					Cumulative (August 24 to December 20, 2014)				
	Influenza A				B	Influenza A				B
	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total
BC	118	0	84	34	3	380	2	302	76	16
AB	556	0	367	189	16	2006	0	1774	232	68
SK	124	0	95	29	0	247	0	142	105	3
MB	44	0	42	2	2	80	0	70	10	4
ON	591	0	375	216	4	1232	4	862	366	29
QC	1,238	0	0	1,238	30	2995	0	0	2995	101
NB	4	0	1	3	0	10	0	4	6	0
NS	12	0	10	2	0	23	0	17	6	3
PE	1	0	1	0	0	7	0	5	2	1
NL	52	0	0	52	0	73	0	16	57	1
Canada	**2,740**	**0**	**975**	**1,765**	**55**	**7053**	**6**	**3192**	**3855**	**226**
Percentage[2]	98.0%	0.0%	35.6%	64.4%	2.0%	96.9%	0.1%	45.3%	54.7%	3.1%

Table 2. Weekly and cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting[3], Canada, 2014-15

Age groups (years)	Weekly (December 14 to December 20, 2014)					Cumulative (August 24 to December 20, 2014)						
	Influenza A				B	Influenza A				B	Influenza A and B	
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	#	%
<5	126	0	36	90	7	496	4	293	199	33	529	7.9%
5-19	171	0	73	98	4	607	0	405	202	33	640	9.6%
20-44	265	0	91	174	9	898	0	494	404	30	928	13.9%
45-64	265	0	89	176	8	784	0	369	415	43	827	12.4%
65+	1,283	0	315	968	17	3664	2	1339	2323	62	3726	56.0%
Unknown	4	0	4	0	0	8	0	6	2	0	8	0.1%
Total	2,114	0	608	1,506	45	6457	6	2906	3545	201	6658	100.0%
Percentage[2]	97.9%	0.0%	28.8%	71.2%	2.1%	97.0%	0.1%	45.0%	54.9%	3.0%		

[1] Specimens from NT, YT, and NU are sent to reference laboratories in other provinces. Cumulative data includes updates to previous weeks.
[2] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
[3] Table 2 includes specimens for which demographic information was reported. These represent a subset of all positive influenza cases reported.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Antiviral Resistance

During the 2014-2015 influenza season, NML has tested 123 influenza viruses for resistance to oseltamivir and zanamivir and all were sensitive to both agents. A total of 154 (99%) of influenza A viruses tested for amantadine resistance were resistant (Table 3).

Table 3. Antiviral resistance by influenza virus type and subtype, Canada, 2014-15

Virus type and subtype	Oseltamivir		Zanamivir		Amantadine	
	# tested	# resistant (%)	# tested	# resistant (%)	# tested	# resistant (%)
A (H3N2)	103	0	103	0	153	152 (99.3%)
A (H1N1)	2	0	2	0	2	2 (100%)
B	18	0	18	0	NA[1]	NA[1]
TOTAL	123	0	123	0	155	154

[1]NA: Not Applicable

Influenza Strain Characterizations

During the 2014-2015 influenza season, the National Microbiology Laboratory (NML) has characterized 59 influenza viruses [37 A(H3N2), 2 A(H1N1) and 20 influenza B]. **Influenza A (H3N2):** When tested by hemagglutination inhibition (HI) assay, 31 of the 37 A(H3N2) viruses characterized were antigenically similar to A/Switzerland/9715293/2013, which is the influenza A(H3N2) component recommended for the 2015 Southern Hemisphere influenza vaccine. One was antigenically similar to A/Texas/50/2012, which is the influenza A(H3N2) component recommended for the 2014-15 influenza vaccine. The remaining five A(H3N2)viruses showed reduced titer to A/Texas/50/2012. Additionally, 112 A(H3N2)viruses were unable to be tested by HI assay; however, sequence analysis showed that 111 belonged to a genetic group that typically shows reduced titers to A/Texas/50/2012. **Influenza A(H1N1):** Two A(H1N1) viruses characterized were antigenically similar to A/California/7/2009, which is the influenza A(H1N1) component recommended for the 2014-15 influenza vaccine. **Influenza B:** Of the 20 influenza B viruses characterized, 17 viruses were antigenically similar to the vaccine strain B/Massachusetts/2/2012. Three viruses showed reduced titers with antiserum produced against strains recommended for the seasonal influenza vaccine (Figure 4).

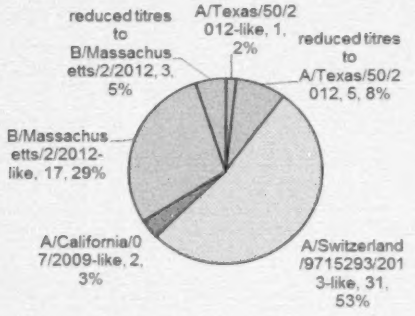

reduced titres to B/Massachusetts/2/2012, 3, 5%
A/Texas/50/2012-like, 1, 2%
reduced titres to A/Texas/50/2012, 5, 8%
B/Massachusetts/2/2012-like, 17, 29%
A/California/07/2009-like, 2, 3%
A/Switzerland/9715293/2013-like, 31, 53%

Figure 4. Influenza strain characterizations, Canada, 2014-15, N = 59

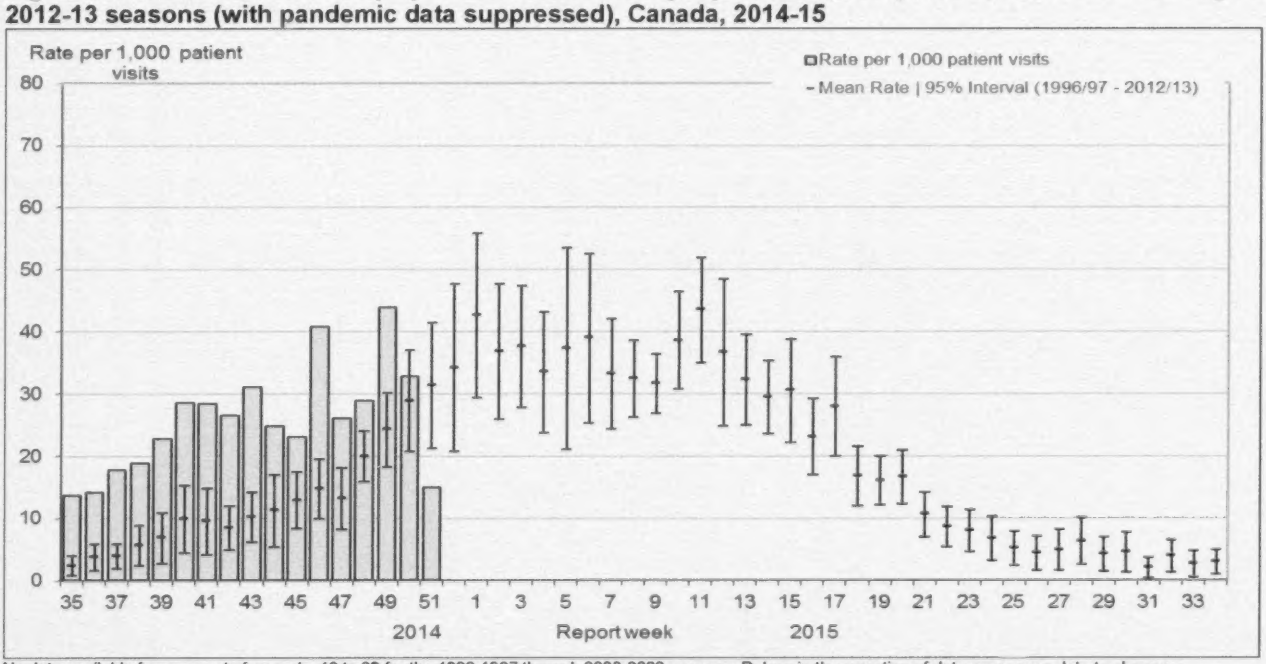
The NML receives a proportion of the number of influenza positive specimens from provincial laboratories for strain characterization and antiviral resistance testing. Characterization data reflect the results of haemagglutination inhibition (HAI) testing compared to the reference influenza strains recommended by WHO.

The recommended components for the 2014-2015 northern hemisphere trivalent influenza vaccine include: an A/California/7/2009(H1N1)pdm09-like virus, an A/Texas/50/2012 (H3N2)-like virus, and a B/Massachusetts/2/2012-like virus (Yamagata lineage). For quadrivalent vaccines, the addition of a B/Brisbane/60/2008-like virus is recommended.

Influenza-like Illness Consultation Rate

The national influenza-like-illness (ILI) consultation decreased in week 51 to 14.97 consultations per 1,000, which is below expected levels for week 51 (Figure 5).

Figure 5. Influenza-like-illness (ILI) consultation rates by report week, compared to the 1996-97 through to 2012-13 seasons (with pandemic data suppressed), Canada, 2014-15

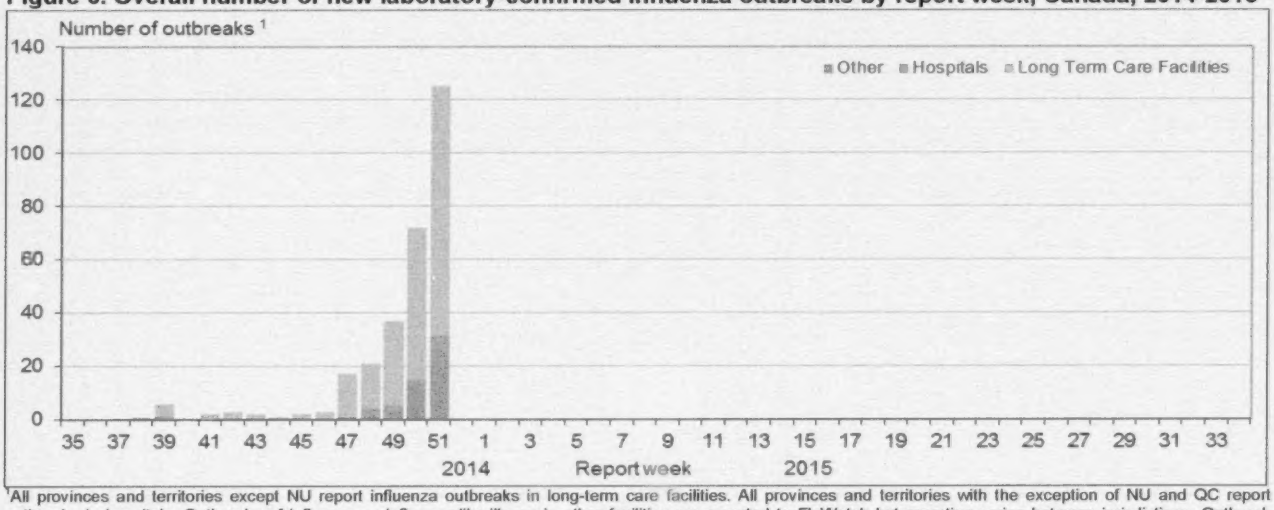


No data available for mean rate for weeks 19 to 39 for the 1996-1997 through 2002-2003 seasons. Delays in the reporting of data may cause data to change retrospectively. The calculation of the average ILI consultation rate over 17 seasons was aligned with influenza activity in each season. In BC, AB, and SK, data is compiled by a provincial sentinel surveillance program for reporting to FluWatch. Not all sentinel physicians report every week.

Influenza Outbreak Surveillance

In week 51, 125 new outbreaks of influenza were reported: 94 in long-term care facilities (LTCF), nine in hospitals and 22 in institutional or community settings (Figure 6). An additional five outbreaks of ILI were reported in schools. Among the outbreaks in which the influenza subtype was known, two LTCF outbreaks, two institutional or community setting outbreaks, and one hospital outbreak were associated with A(H3N2). To date this season, 235 outbreaks in LTCF have been reported. The number of outbreaks reported is similar to the number reported in week 51 during the 2012-13 influenza season when influenza A(H3N2) also predominated.

Figure 6. Overall number of new laboratory-confirmed influenza outbreaks by report week, Canada, 2014-2015

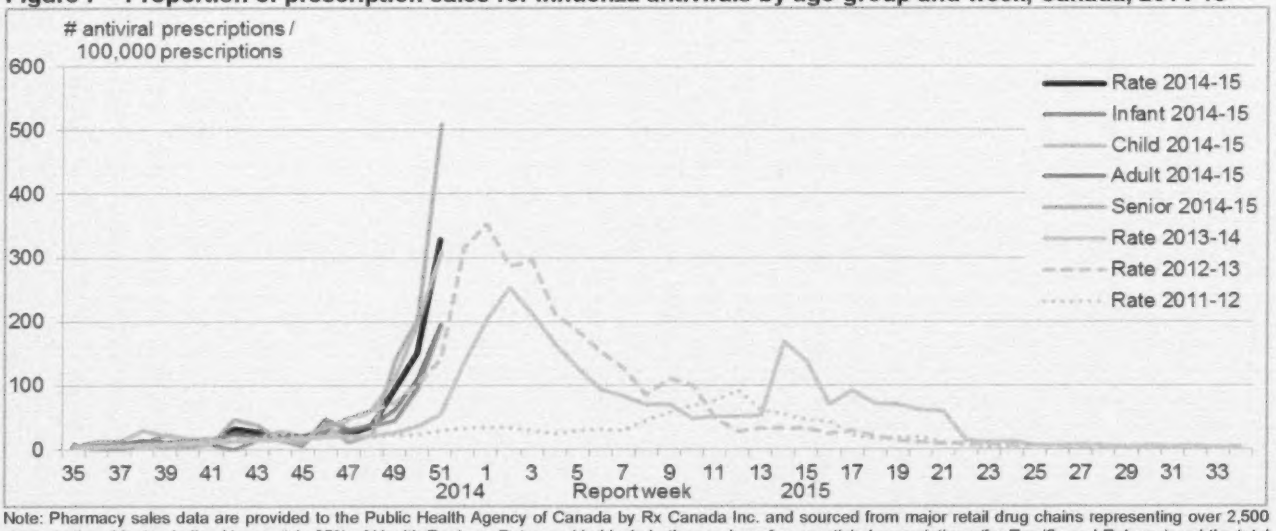


[1]All provinces and territories except NU report influenza outbreaks in long-term care facilities. All provinces and territories with the exception of NU and QC report outbreaks in hospitals. Outbreaks of influenza or influenza-like-illness in other facilities are reported to FluWatch but reporting varies between jurisdictions. Outbreak definitions are included at the end of the report.

Pharmacy Surveillance

During week 51, the proportion of prescriptions for antivirals increased to 328.5 antiviral prescriptions per 100,000 total prescriptions (up from 150.3 antiviral prescriptions per 100,000 total prescriptions from the previous week). The rate for antivirals is higher than the previous three seasons (Figure 7). The rates in all age groups increased from the previous week; however, the rate doubled among seniors (205.7 to 509.03 per 100,000 total prescriptions).

Figure 7 – Proportion of prescription sales for influenza antivirals by age-group and week, Canada, 2014-15



Note: Pharmacy sales data are provided to the Public Health Agency of Canada by Rx Canada Inc. and sourced from major retail drug chains representing over 2,500 stores nationwide (excluding Nunavut) in 85% of Health Regions. Data provided include the number of new antiviral prescriptions (for Tamiflu and Relenza) and the total number of new prescriptions dispensed by Province/Territory and age group. Age-groups: Infant: 0-2y, Child: 2-18y; Adult: 19-64y, Senior: ≥65y

Sentinel Hospital Influenza Surveillance

Paediatric Influenza Hospitalizations and Deaths (IMPACT)

In week 51, 56 laboratory-confirmed influenza-associated paediatric (≤16 years of age) hospitalizations were reported by the Immunization Monitoring Program Active (IMPACT) network: 55 cases of influenza A and one case of influenza B (Figure 8a). Among reported cases, 19 (34%) were <2 years of age, 22 (39%) were 2 to 9 years of age and 15 (27%) were 10-16 years of age. Four cases were admitted to the ICU. To date this season, 203 hospitalizations have been reported by the IMPACT network, 187 (92%) of which were cases of influenza A. Among cases for which the influenza A subtype was reported, 98% (92/94) were A(H3N2). Children <5 years of age represented 56% of cases (Table 4). To date, 16 cases were admitted to the ICU, of which 10 (63%) were 2 to 9 years of age (Figure 9a). Among cases admitted to the ICU with available data, 79% (11/14) were reported to have underlying conditions or comorbidities.

Note: The number of hospitalizations reported through IMPACT represents a subset of all influenza-associated paediatric hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Adult Influenza Hospitalizations and Deaths (PCIRN)

In week 51, 73 laboratory-confirmed influenza-associated adult (≥16 years of age) hospitalizations were reported by the PHAC/CIHR Influenza Research Network (PCIRN) Serious Outcomes Surveillance (SOS) network. Sixty cases (82%) were in adults over the age of 65. Seventy-one cases (97%) were influenza A (Figure 8b). To date this season, 230 cases have been reported; 227 (99%) with influenza A. The majority of cases (85%) were among adults ≥65 years of age (Table 5). Eighteen ICU admissions have been reported and the majority of cases (77.8%) were adults ≥65 years of age with underlying conditions or comorbidities. Eight deaths have been reported, all adults >65 years of age (Figure 9b).

Note: The number of hospitalizations reported through PCIRN represents a subset of all influenza-associated adult hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Table 4 – Cumulative numbers of paediatric hospitalizations with influenza reported by the IMPACT network, Canada, 2014-15

Age groups	Cumulative (24 Aug. 2014 to 20 Dec. 2014)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)[2]	Total	# (%)
0-5m	20	0	10	10	2	22 (10.8%)
6-23m	39	1	16	22	2	41 (20.2%)
2-4y	45	1	24	20	6	51 (25.1%)
5-9y	53	0	27	26	4	57 (28.1%)
10-16y	30	0	15	15	2	32 (15.8%)
Total	187	2	92	93	16	203
% [1]	92.1%	1.1%	49.2%	49.7%	7.9%	100.0%

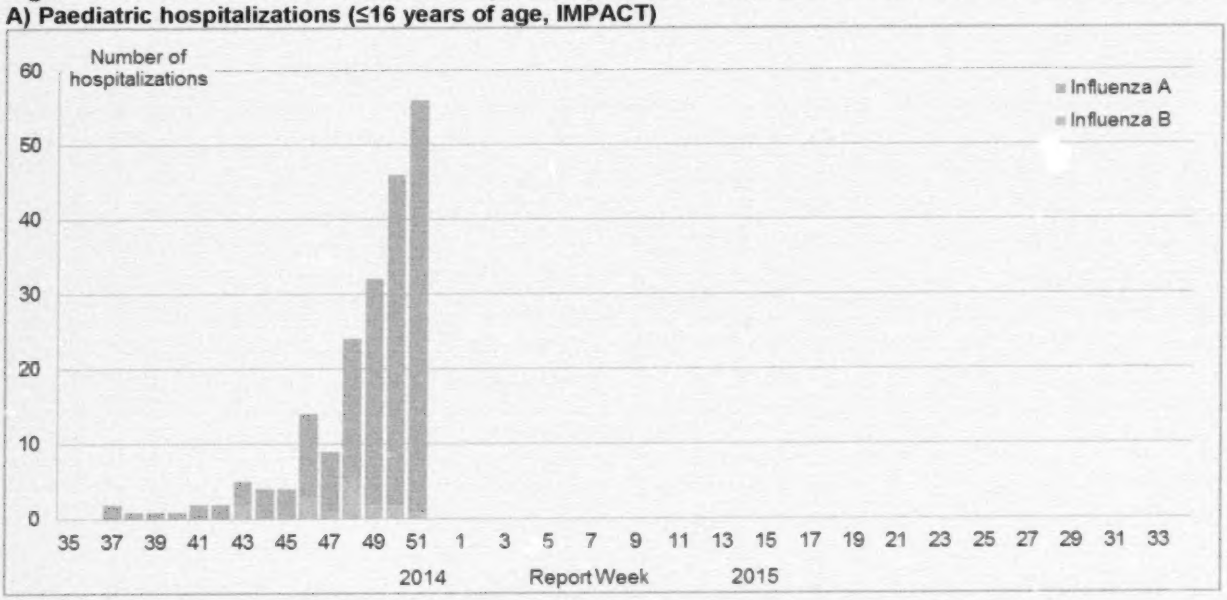
Table 5 – Cumulative numbers of adult hospitalizations with influenza reported by the PCIRN-SOS network, Canada, 2014-15

Age groups (years)	Cumulative (15 Nov. 2014 to 20 Dec. 2014)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
16-20	2	0	0	2	0	2 (1%)
20-44	13	0	4	9	0	13 (6%)
45-64	20	0	7	13	0	20 (9%)
65+	192	1	22	169	3	195 (85%)
Total	227	1	33	193	3	230
%	99%	0%	15%	85%	1%	100%

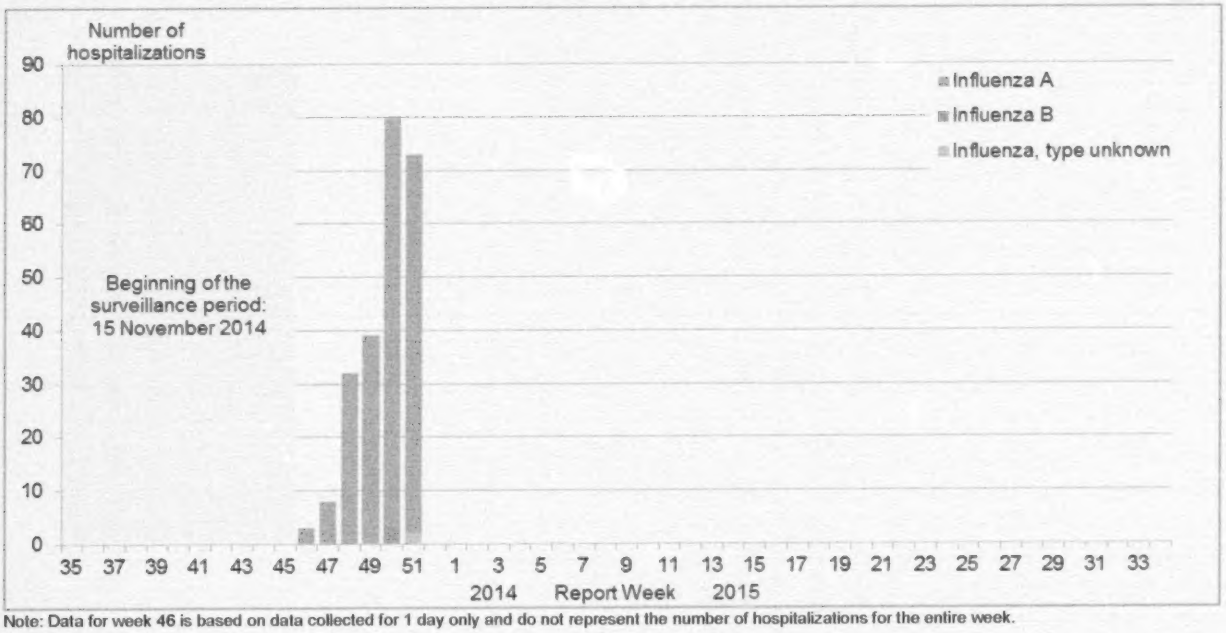
[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections. UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Figure 8 – Number of cases of influenza reported by sentinel hospital networks, by week, Canada, 2014-15

A) Paediatric hospitalizations (≤16 years of age, IMPACT)



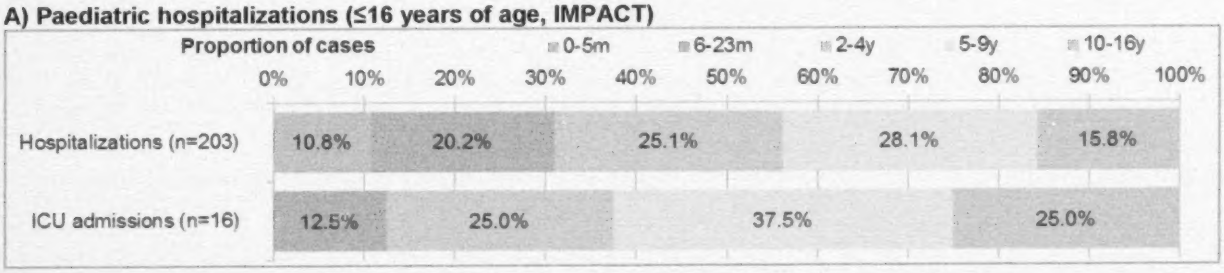
B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



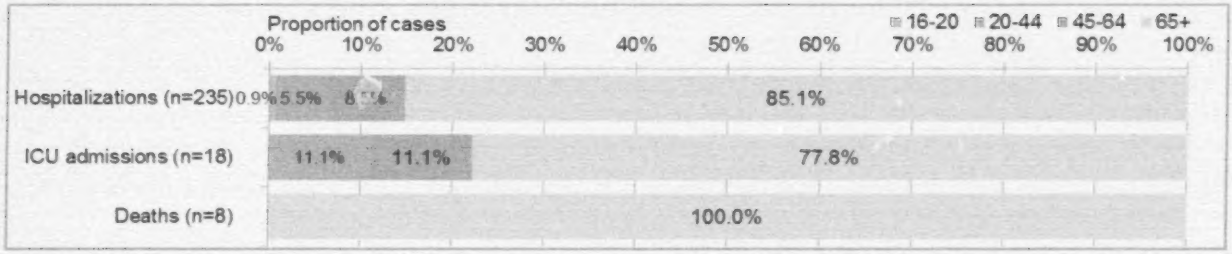
Note: Data for week 46 is based on data collected for 1 day only and do not represent the number of hospitalizations for the entire week.

Figure 9 – Percentage of hospitalizations, ICU admissions and deaths with influenza reported by age-group, Canada, 2014-15

A) Paediatric hospitalizations (≤16 years of age, IMPACT)



B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



Provincial/Territorial Influenza Hospitalizations and Deaths

In week 51, 187 laboratory-confirmed influenza-associated hospitalizations were reported from participating provinces and territories*; all but three with influenza A, and 63% were patients ≥65 years of age. Since the start of the 2014-15 season, 782 hospitalizations have been reported; 762 (97%) with influenza A. Among cases for which the subtype of influenza A was reported, 99% (536/538) were A(H3N2). The majority of cases (60%) were ≥65 years of age (Table 6). Seventeen ICU admissions have been reported in adults ≥65 years of age with influenza A. Forty deaths with influenza A have been reported: one child <5 years of age, one adult 45-64 years and 38 adults ≥65 years of age. Detailed clinical information (e.g. underlying medical conditions) is not known for these cases.

* Note: Influenza-associated hospitalizations are not reported to PHAC by the following Provinces and Territory: BC, NU, QC, and NB. Only hospitalizations that require intensive medical care are reported by Saskatchewan. ICU admissions are not distinguished among hospital admissions reported from Ontario. Data may also include cases reported by the IMPACT and PCIRN networks. The number of new influenza-associated hospitalizations and deaths reported for the current week may include cases from Ontario that occurred in previous weeks, as a result of retrospective updates to the cumulative total. It is important to note that the hospitalization or death does not have to be attributable to influenza, a positive laboratory test is sufficient for reporting.

Table 6 – Cumulative number of hospitalizations with influenza reported by the participating provinces and territories, Canada, 2014-15

Age groups (years)	Cumulative (24 Aug. 2014 to 20 Dec. 2014)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
0-4	78	1	52	25	2	80 (10%)
5-19	67	0	46	21	2	69 (9%)
20-44	54	1	40	13	4	58 (7%)
45-64	86	0	69	17	2	88 (11%)
65+	462	0	314	148	9	471 (60%)
Unknown	15	0	15	0	1	16 (2%)
Total	762	2	536	224	20	782
Percentage[1]	97.4%	0.3%	70.3%	29.4%	2.6%	100.0%

[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

See additional data on Reported Influenza Hospitalizations and Deaths in Canada: 2009-10 to 2014-15 on the Public Health Agency of Canada website.

Emerging Respiratory Pathogens

Human Avian Influenza

Influenza A(H7N9): Since the last FluWatch report, one new laboratory-confirmed case of human infection with avian influenza A(H7N9) virus have been reported by the World Health Organization. Globally to December 31, 2014, the WHO has been informed of a total of 470 laboratory-confirmed human cases with avian influenza A(H7N9) virus, including 182 deaths.

Documents related to the public health risk of influenza A(H7N9), as well as guidance for health professionals and advice for the public is updated regularly on the following websites:
PHAC – Avian influenza A(H7N9)
WHO – Avian Influenza A(H7N9)

Influenza A(H5N6): One new laboratory-confirmed case of human infection with avian influenza A (H5N6) virus from China has been reported by the World Health Organization. The case was an adult under 65 years of age with history of exposure to live poultry trade market. No sustained human to human transmission was reported. Globally to December 31, 2014, Avian influenza A (H5N6) was only found in poultry, except once when this sub-type of virus was detected in one case from China that died of severe pneumonia in April 2014.

Middle East Respiratory Syndrome Coronavirus (MERS-CoV)

Since the last FluWatch report, three laboratory-confirmed cases and one death of MERS-CoV have been reported by the World Health Organization. Globally, from September 2012 to December 31, 2014, the WHO has been informed of a total of 941 laboratory-confirmed cases of infection with MERS-CoV, including 347 deaths. All cases have either occurred in the Middle East or have had direct links to a primary case infected in the Middle East. The public health risk posed by MERS-CoV in Canada remains low (see the PHAC Assessment of Public Health Risk).

Documents related to the public health risk of MERS-CoV, as well as guidance for health professionals and advice for the public is updated regularly on the following websites:
PHAC – Middle East respiratory syndrome coronavirus (MERS-CoV)
WHO – Coronavirus infections

Avian Influenza A(H5)

The Canadian Food Inspection Agency (CFIA) is continuing its investigation into an outbreak of highly pathogenic avian influenza H5N2 virus in British Columbia's Fraser Valley. To date, there have been 11 commercial infected premises and one non-commercial infected premise. As part of regular investigation activities, CFIA is fully tracing movements in and out of these sites. This may lead to further premises being identified and depopulated, which would not be unexpected. While there are no reports of H5N2 related illness in humans, as a precautionary measure public health officials are monitoring workers who are exposed to affected poultry. Avian influenza viruses do not pose risks to food safety when poultry and poultry products are properly handled and cooked. Avian influenza rarely affects humans that do not have consistent contact with infected birds. Further information on the outbreak is provided on the following CFIA website.
CFIA - Notifiable Avian Influenza

Enterovirus D68 (EV-D68)

Information related to enterovirus D68, as well as guidance for health professionals and advice for the public is updated regularly on the following website:
PHAC – Non-polio enterovirus

International Influenza Reports

World Health Organization influenza update
World Health Organization FluNet
WHO Influenza at the human-animal interface
Centers for Disease Control and Prevention seasonal influenza report
European Centre for Disease Prevention and Control - epidemiological data
South Africa Influenza surveillance report
New Zealand Public Health Surveillance
Australia Influenza Report
Pan-American Health Organization Influenza Situation Report

FluWatch Definitions for the 2014-2015 Season

Abbreviations: Newfoundland/Labrador (NL), Prince Edward Island (PE), New Brunswick (NB), Nova Scotia (NS), Quebec (QC), Ontario (ON), Manitoba (MB), Saskatchewan (SK), Alberta (AB), British Columbia (BC), Yukon (YT), Northwest Territories (NT), Nunavut (NU).

Influenza-like-illness (ILI): Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which is likely due to influenza. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

ILI/influenza outbreaks

Schools: Greater than 10% absenteeism (or absenteeism that is higher (e.g. >5-10%) than expected level as determined by school or public health authority) which is likely due to ILI. Note: it is recommended that ILI school outbreaks be laboratory confirmed at the beginning of influenza season as it may be the first indication of community transmission in an area.

Hospitals and residential institutions: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case. Institutional outbreaks should be reported within 24 hours of identification. Residential institutions include but not limited to long-term care facilities (LTCF) and prisons.

Workplace: Greater than 10% absenteeism on any day which is most likely due to ILI.

Other settings: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case; i.e. closed communities.

Note that reporting of outbreaks of influenza/ILI from different types of facilities differs between jurisdictions.

Influenza/ILI Activity Levels

1 = No activity: no laboratory-confirmed influenza detections in the reporting week, however, sporadically occurring ILI may be reported

2 = Sporadic: sporadically occurring ILI and lab confirmed influenza detection(s) with **no outbreaks** detected within the influenza surveillance region†

3 = Localized: (1) evidence of increased ILI* ;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring in **less than 50% of the influenza surveillance region**†

4 = Widespread: (1) evidence of increased ILI*;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring **in greater than or equal to 50% of the influenza surveillance region**†

Note: ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls.

** More than just sporadic as determined by the provincial/territorial epidemiologist.*

† Influenza surveillance regions within the province or territory as defined by the provincial/territorial epidemiologist.

We would like to thank all the Fluwatch surveillance partners who are participating in this year's influenza surveillance program.

This report is available on the Public Health Agency website at the following address: http://www.phac-aspc.gc.ca/fluwatch/index.html.

Ce rapport est disponible dans les deux langues officielles.